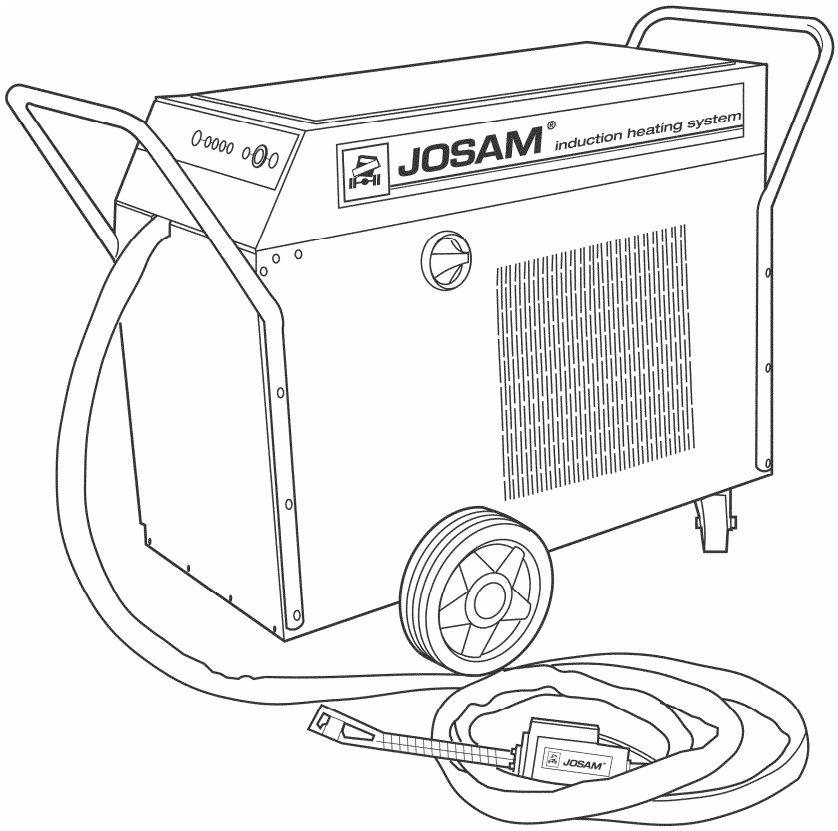


CE

Operator Instruction and Safety regulations

Induction Heating system JO960 A

JOSAM

Introduction

The **Operator Instructions** must be read by all personnel handling or repairing the equipment. By following this manual the operator should be able to undertake correct and safe operation of the equipment.

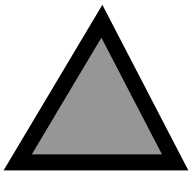
The **Technical Service Information** should be read through by the operator as well as service personnel. However only qualified personnel should carry out troubleshooting and maintenance.

Safety instructions

Safety instructions will be found throughout the manual where appropriate. All safety instructions will be marked with the following symbol:

Advice and warnings

Important information is marked with the symbol below. This information might be of greatest importance to avoid operation disturbances or to avoid injury to persons.



General information

J0960 A is a mobile induction generator with a built in cooling system. The JO960 has been designed for heating all normally magnetic material. The JO960 will concentrate a powerful magnetic field at the end of the heating tip. This magnetic field creates eddy currents in the material, thus creating heat.

Technical data

Size: (including handles and wheels)	1300 x 660 x 900 mm (LxWxH)
Weight: (full water tank)	180 Kg
Output power:	13 kW
Frequency:	15 kHz
Enclosure:	IP62

Installation / Mains supply

Mains supply:	3 x 380-400V 3Ph+PE
Frequency:	50/60 Hz
Recommended fuse:	32 A

Safety precautions and hazards

General

All those operating, maintaining or working in close proximity to the equipment must read and understand the safety instructions in this manual.

- **Due to very high voltages the casing must not be removed or opened during operation.**
- **Do not under any circumstances touch open wires, connectors or any other electric conductive parts.**
- **The main switch must be turned off and the plug disconnected from the power line socket prior to any form of maintenance being performed.**

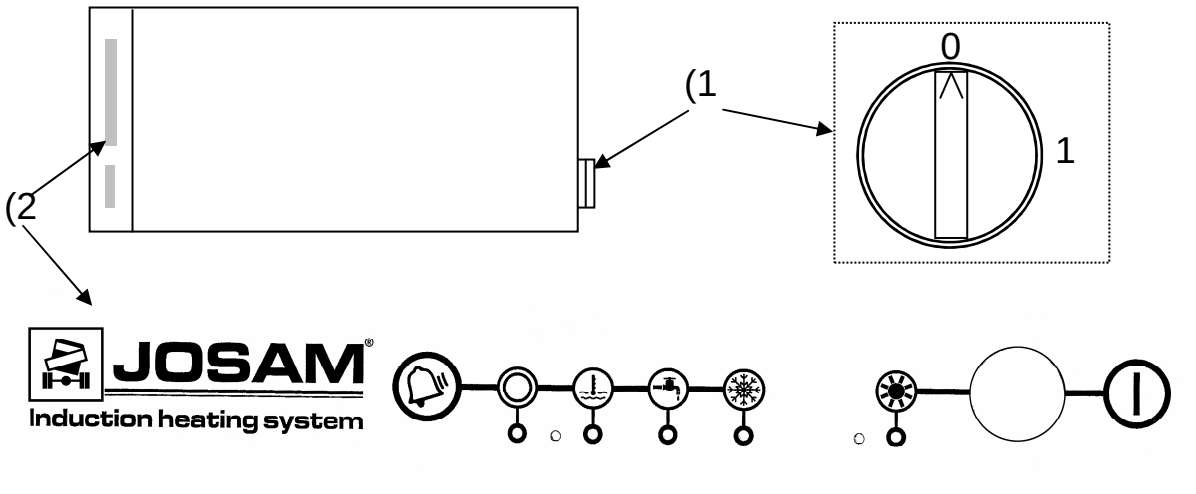
- Remark! There will be remaining current approx 10 min after disconnecting the heater.

- **Do not touch any object that has been near the heating tip without ensuring that it has cooled off.**
- **Always comply with all safety measures when handling electrical equipment, including any national or interna-tional regulations**
- **Immediately disconnect the JO960 if any damage or malfunction appears. Contact trained service personnel.**
- **Provide necessary ventilation and avoid inhaling smoke gases which are formed when heating**

• Controls and indicators

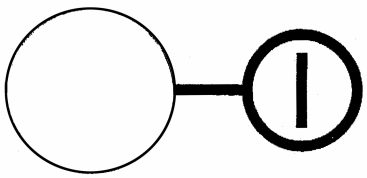
Main switch (1) is placed on the right side of JO960. The main switch breaks all power to this equipment. As soon as the main switch is turned on the cooling unit will start functioning.

All other controls and indicators are mounted on the front panel (2).



Figur 1: *Controls and indicators*

Controls



"Start/Reset switch"

Prior to working with JO960 this switch must be activated.

"Operation"

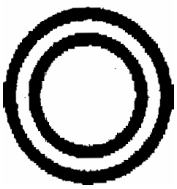
This indicator will be illuminated when the start switch placed on hand held transformer is activated and the JO960 curcuits function correctly.

Indicators

"ALARM"

If any of the indicators that are graphically connected to this symbol are illuminated the JO960 will not function.

"RESET"



This indicator will always be illuminated when the main switch to JO960 is switched on but the heater is not started.

This indicator will not be illuminated after the "Reset/Start switch" has been pressed

"**"***OVER TEMPERATURE***"**

This indicator will be illuminated if the cooling water temperature exceeds 30˚C.

"WATER FLOW"

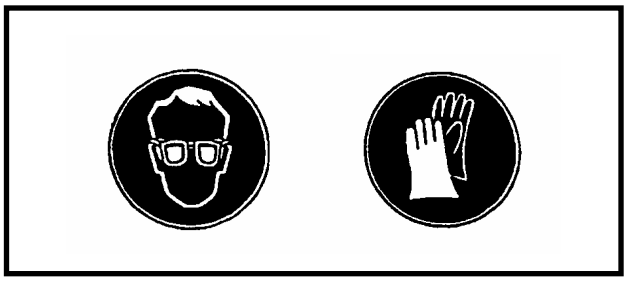
This indicator will be illuminated if the cooling water is not flowing correctly.

"COOLING UNIT"

This indicator will be illuminated at any malfunction in the cooling unit.

Before using JO960

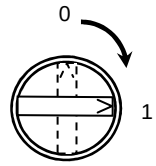
- Heat only naturally magnetic material.
- Check that all necessary safety precautions have been taken. (*see Safety instructions on page 3)*.
- Anyone operating the JO960 should avoid to wear or have metal objects such as watches, ring, keys etc. Since these objects could be heated unintentionally by the magnetic field from the heating tip.
- The working area should be cleared from combustible items to prevent these items being ignited by the work piece being heated by this equipment.



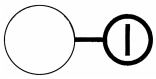
Starting and working with JO960

Start the induction heater

1. Make sure that nothing obstructs the airflow through the sides of JO960.
2. Turn the main switch to position 1.
   "Reset" will be illuminated on the front panel.



3. Press the **"'Start/Reset switch"**
   "Reset" will go out and the *"Start/Reset switch"* will be illuminated.



Work with JO960

4. Place the heating tip on the work piece and press the **On/Off switch** on the hand held transformer.
5. Move the heating tip over the work piece that is to be heated.

Remark: Do not press the heating tip hard against the work piece. It only wears the heating tip unnecessarily.
No higher effect will be reached through pressing the heating tip against the work piece. It is quite sufficient to put the heating tip against the work piece

6. Release the **on/off switch** when the work piece has reached the correct temperature. (See e.g. JOSAM's colour scale, T43 1-2-3 9712), and the heating tip stops heating.

Handling instructions for JO960

JO960 is divided into two main parts. The top (painted red) contains all control and power electronics. Transformer cable equipped with a control unit and a heating tip is connected to this upper part.

The lower part (painted silver) contains the cooling unit and water tank

Cooling unit

The working piece and the heating tip distribute much heat, water is used as cooling agent. The water is cooled by a compressor with a condensor (cooling unit). The cooling system is controlled automatically.

To access the cooling unit turn open the knob (6 on figure 2) and carefully lift the electronic part (upper painted red) lift it to upright position.

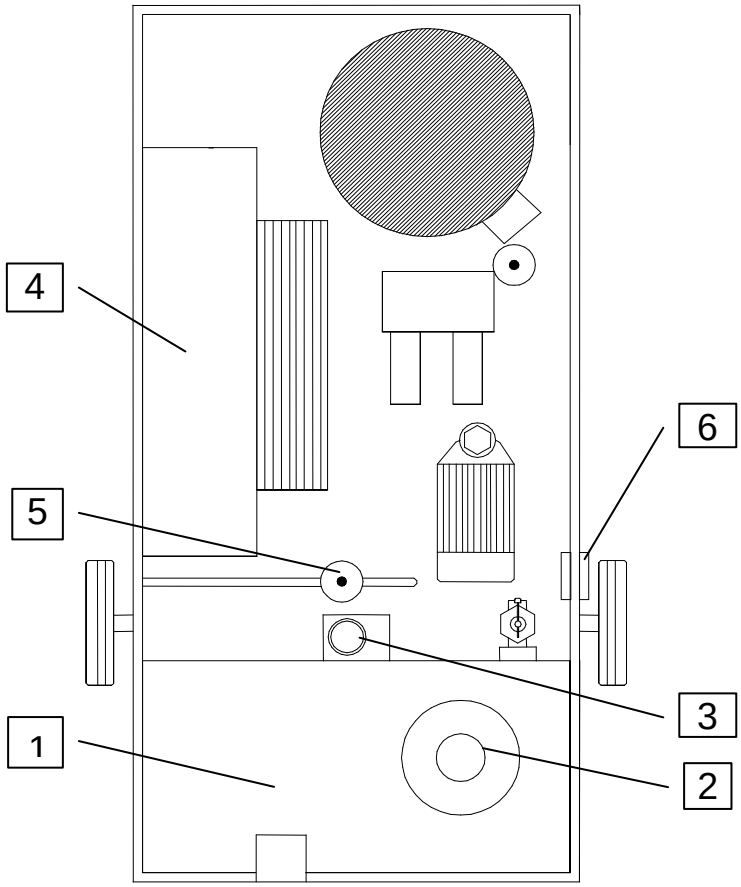


Figure 2: *Cooling unit*

1. Water tank contains 40 litre cooling media.
2. Filling hole
3. Thermostat
4. Condensor
5. High pressure pressostat
6. Opening knob

Water tank/ refilling

When shipped the water tank (see 1 on Figure 2) is filled with approx. 40 litres of water with a mixture of water and *Ethylenglycol* to prevent freezing. The cooling liquid must have a freezing point below -15ºC (5ºF).

Check regularly that the water level is above the hole for the return water, which can be found on the side of the water tank. Use a glycol dilution with the correct freezing point when the water tank is being filled. The most commonly sold marks of glycol for vehicles can be used in JO960. The most commonly used is *Ethylenglycol* but also *Polypropylenglycol.*

Remark: Different kinds of glycol should not be mixed, as it then loses its characteristics and the freezing point can no longer be controlled. If Ethylenglycol is not available the water tank must be emptied completely before it is refilled.

Setting of the temperature of the cooling water

To secure that JO960 works satisfactorily, the temperature of the cooling water must be set correctly. Factors, that will influence this setting is.

- The time and frequency when the machine is used for heating.
- The ambient temperatures when running the machine.
- Air cirulation inside the machine.

The thermostat is used for setting the temperature in the cooling unit (See 3 on Figure 2). There are two types of thermostats. One, that is preset to 15 degrees, need not to be adjusted under normal working conditions. The other kind of thermostat, that is adjustable, could be set to 0 under normal working condition.

When the temperature is lowered it might cause condence to form on the control unit due to the air humidity of the surroundings.

Cleaning of condensor

JO960 creates much heat and therefore requires that the airflow is not obstructed. The condensor (cooling unit, see No 4 on Figure 2) need to be cleaned regularly.

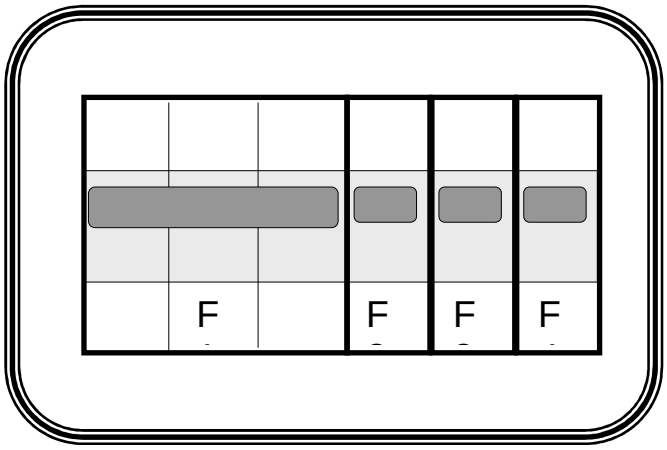
Lukewarm water is perfect for cleaning. If heavily dirty a degreasing compound can be used.

REMARK: Never use a high-pressure washer, it might damage the condensor.

Electronic part

The electronic part does not contain any parts the requires special care. At the bottom of this part there are four (4) fuses.

To access the fuses unit, turn the handle and carefully lift the electronic unit - top (painted red) to an upright position.



F1/32A – Main fuse to electronic unit

F2/2A – Water pump

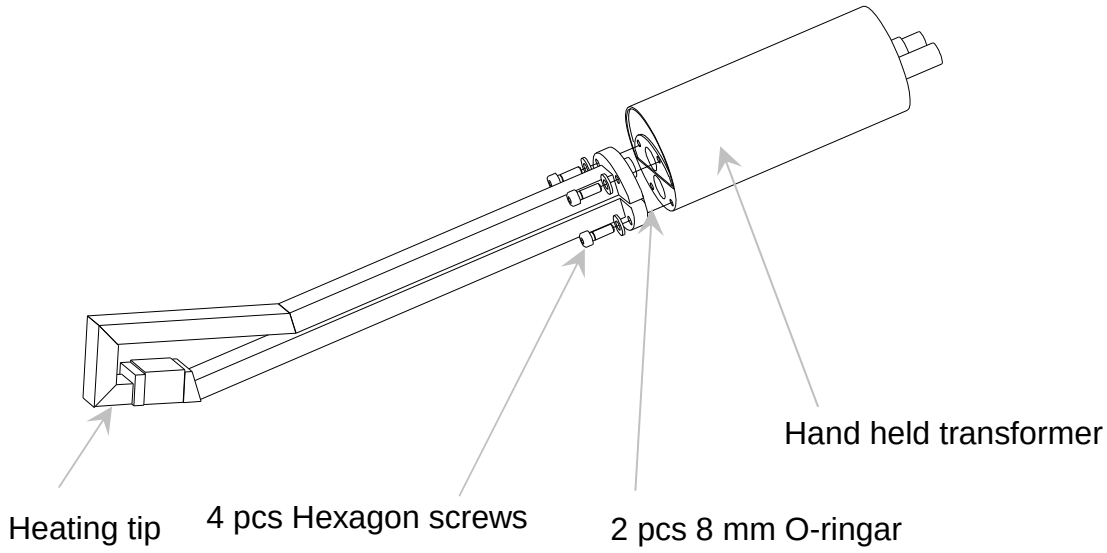
F3/10A –Cooling fan

F4/10A – Compressor

Figur 3: *where to find the fuses*

The fuses are resetable fuses and must be reset manually.

Heating tip



Figur 4: *Changing of heating tip*

Check of heating tip

Check regularly the following:

- That there is no water leakage around the heating tip.
- That the isolation is not damaged.
- That it is not bent or in any other way damaged.

Remark: A damaged heating tip should always be changed

Changing of heating tip

1. Switch off the main switch.
2. Loosen the hexagon screws.
3. Loosen the heating tip.
4. Check that all contact surfaces are undamaged and clean

Remark: Never use any grease or fat on the contact surfaces**.**

5. Assemble the new heating tip. Check that the O-rings are not damaged.

Remark: Never replace the previous screws with screws of magnetic material.

6. If necessary alter the position of start/stop switch.

Remark: Use only heating tips supplied by JOSAM.

Operator measures at malfunctions

If there is any malfunction JO960 automatically switches off and an indicator is illuminated. The operator could then perform a preliminary trouble shooting to solve minor problems.

If the indicator of the cooling unit has been illuminated it can be due to:

- *Thermostat is incorrectly adjusted.* Check the water temperature. If the water is cold the thermostat is set at too low temperature. Certain machines, that are equipped with a turnable knob, should normally be set at zero. Thermostats without a knob should normally be set at 15°.
  If the water is warm and the machine has been used continuously for a long time, it might be necessary to reset the thermostat to a higher position and lower the temperature.

- *Airflow through the machine* is obstructed due to the fact that the sides of the machine or the condensor (the cooling unit) is filled with dirt. Cleaning of the condensor is described on page 10. Before using the machine again the high pressure safety pressostat must be reset, (See 5 on Figure 2).

- *Ambient temperature is too high.* In extreme cases the ambient temperature could exceed (50ºC). In this case the high pressure pressostat must be reset manually. Check that the cooling water has cooled down to a low temperature before starting to work again.

Remark: Reset can only be done after the JO 960 hs been left to cool down. During this period the JO960 should be switched on at the main switch so that the cooling fan is rotating.

Remark: Avoid placing the machine in sunny places.

If the machine indicates high temperature the cooling water is too warm. This might be caused by

- *Compressor has stopped.* Check if the fuse F4 (See table on Figur 3) has blown.
- *Extremely hard usage* during a long period.

This indicator will be illuminated if the cooling water is not flowing correctly, which might be caused by

- *Circulation pump does not work.* Check if the Fuse F2 has blown.
- *The cables, hand held transformer or heating tip are malfunctioning.* Check that they are not damaged in any way.

”Reset” indicator is illuminated when the electronic unit of JO960 does not work properly. Possibly caused by

- *Shortcircuit of heating tip or hand held transformer*. If the heating tip is damaged, it must be changed. (see Changing of heating tip on page 11).
- *Inadequate earthing for hand held unit.* Check ground cables (yellow/green cables) as well as their connections in the hand held unit.

Remark: Only trained service technicians are allowed to perform any work on electronic unit, compressor and electric couplings.